



# IEEE Enlightenor

Institute of Electrical and Electronics Engineers

---

Los Alamos Section Serving Northern New Mexico

October – November 2000

---

## LUNCHTIME SEMINAR:

**Join the Los Alamos IEEE Section and the  
Executive Committee for**

**The Annual Free Lunch for IEEE Members**

**October 23, 2000**

**11:30 p.m. – 1:30 p.m.**

**LANL, Otowi Cafeteria**

**Side Room A & B**

**Menu will be Enchiladas, Salad, Beans, Rice,  
Dessert, and Iced Tea (Chicken or Beef or  
Cheese?)**

To IEEE members and guests:

Please join us for the IEEE Free Lunch, October 23, 2000.

If you plan to attend the free lunch, please send a check payable "IEEE LAS" to the IEEE Los Alamos Section, Treasurer, Teri Roberts, 107 Sherwood Blvd., Los Alamos, NM 87544, in the amount of \$15.00 on or before October 20, 2000. If you are a member, you will get the check back. For nonmembers this will be the cost of the lunch.

More information, please contact Paul Tallerico at email: [tallerico@lanl.gov](mailto:tallerico@lanl.gov) or Voice Phone: 505-667-1197

The Program:

**Implementation of an Adaptive Delta  
Modulator using Fuzzy Logic  
By Lawrence Tofoya**

### ABSTRACT

The goal of this paper is to verify the idea that fuzzy logic can be applied for the implementation of certain types of analog-to-digital converters. In particular we have implemented and simulated our idea using a delta modulator that has a syllabic companding algorithm. To understand the entire concept it is necessary to first introduce some basics in linear delta modulation (LDM), adaptive

delta modulation (ADM), and fuzzy logic. A linear delta modulator consists of a comparator with a sampler in the forward part and an integrator in the feedback path of a simple control loop. Continuous Variable Slope Delta Modulation (CVSDM), the type of ADM addressed in this paper, is a simple alternative to more complex conventional conversion techniques in systems requiring digital communication of analog signals. In CVSDM, the frequency limitations are governed by the Nyquist rate while the amplitude capabilities are set by the gain of the integrator. CVSDM contains an algorithm that monitors the past few outputs of the delta modulator. Fuzzy logic is a method of using the expert knowledge of a system to simplify and perform complex reasoning using inference rules. Implementation of fuzzy logic using the CVSDM algorithm proposed by Motorola was first done to verify the validity of our idea and then a new system was designed and simulated using Matlab.

---

## JOIN THE LOS ALAMOS IEEE SECTION / COMPUTER SOCIETY ADVANCES IN WEB SEARCH TECHNOLOGY

---

**Jim McDonald and Abe Lederman of**

**Innovative Web Applications**

**Thursday, October 5th, 2000**

**12:00 PM (noon) to 1:00 PM**

**Otowi Cafeteria, Side Rooms A & B  
(near the cafeteria)**

---

Have you ever felt overwhelmed by the amount of information that is available via the World Wide Web? Don't miss this exciting opportunity to learn about tools and techniques that make electronic information gathering and use more manageable.

Jim McDonald and Abe Lederman of Innovative Web Applications, a local Los Alamos business,

will be joining us for our next technical talk to share their knowledge of advanced search strategies for the "invisible web" and new technologies for focused searching and browsing. Mark your calendar!

### **Biographical Data of Speakers:**

Abe Lederman is the founder, President, and Chief Technology Officer of Innovative Web Applications, Inc., and the principal author of the suite of Explorer software applications that are used by Los Alamos National Laboratory (LANL) and the Department of Energy (DOE).

Mr. Lederman has worked extensively in the software industry for nearly twenty years and was one of the original developers of Verity's search and retrieval application, now regarded as one of the premier applications in that market. While under contract to LANL, Mr. Lederman provided the software that was ultimately deployed in more than a dozen applications for the Laboratory, Sandia National Laboratories, and the entire DOE complex. The SciSearch and DOE Directives Online applications - both developed by Mr. Lederman - have received considerable recognition in the press and numerous awards from LANL, the DOE, and the Smithsonian Institution. Mr. Lederman has Bachelor's and Master's degrees in Computer Science from MIT.

Jim McDonald joined Innovative Web Applications in February 2000 as Vice President for Business Development. Mr. McDonald gained extensive experience with systems analysis, business process engineering, operations management, and marketing while working in the transportation, publishing, and healthcare industries. While at LANL the past nine years he, Mr. McDonald worked on requirements, systems analysis, and development projects in intelligence, non-proliferation, weapons archives, digital libraries, and business operations. Most recently, as Section Leader for Knowledge Management Technologies in CIC-15 (LANL's Advanced Database and Information Technology Group), Mr. McDonald had overall responsibility for marketing, personnel, budgets, and technical direction for over thirty developers working on more than fifty projects, with revenues in excess of \$2 million per year. In recent years, Mr. McDonald and the development teams he

managed received awards and recognition for their work including the LANL Distinguished Performance Award, the Hammer Award from Al Gore's National Partnership for Re-inventing Government, two Department of Energy Quality Awards, and several LANL Achievement Awards.

Mr. McDonald has Bachelor's degrees in Philosophy and English from Spring Hill College in Mobile, Alabama.

Mr. Lederman and Mr. McDonald may be reached via the following contact points:

Innovative Web Applications  
975 Central Ave.  
Los Alamos, NM 87544

Voice (505) 663-1302  
Fax (505) 663-1304

Email [info@iwapps.com](mailto:info@iwapps.com)  
Web URL [www.iwapps.com](http://www.iwapps.com)

---

**CHAIR'S CORNER**  
**PAUL J. TALLERICO**  
**LOS ALAMOS SECTION CHAIRMAN**

---

### **IEEE NEEDS YOU:**

Did you know there are almost 400 IEEE members in our Section? This is old news, but the new news is that the number of volunteers that we can find is down from eight (on a good day) to only four. The reasons for the drop were sometimes real, but most usually it is just apathy. The big IEEE and your local Section both want to help the members, and have been taking steps to do so. For example, the IEEE-USA was running a big surplus that was used primarily to subsidize a Professional Development Conference each year that 600 people attended. Now the Sections pay for this conference, and the surplus is being spent on the Today's Engineer magazine, which goes to a few thousand IEEE members.

In our Section, we have stopped subsidizing the Executive Committee's lunches when we meet, and we have gone to a once a year free lunch for all members. These are two attempts, one national and one local, to spread out the surpluses to more

members. So come and get your share, and enjoy the enchiladas with us on October 23.

We really do need more people to share the challenges of running this organization. We need members to volunteer to either run for the few elected positions, or to fill out the many appointed positions that we have. The elected positions are the Chair, Vice Chair, and Secretary/Treasurer. I would like to separate the secretary job from the treasurer job. Appointed positions are the Newsletter editor, awards, programs, and similar offices in the chapters. No experience is needed, we'll provide on the job training, and being an Officer will look good on your resume. Send me an email if you want to either run for an office, or be appointed to help in the other Section or Chapter positions for a year.

Paul Tallerico  
Los Alamos Section Chair  
Phone: 505-667-1197  
Fax: 505-665-2818  
E-mail: [tallerico@lanl.gov](mailto:tallerico@lanl.gov)

---

#### **IEEE SCHOLARSHIPS AWARDS**

We had a very competitive field of 15 scholarship applications this year. The evaluation committee (David Israelivitz, Jim Gattiker, and Hal Weil) found it a challenge to decide on only two recipients for awards from the Kenneth Riepe and Vern Trexler scholarship funds. The awards are \$475 each. The honors convocation was postponed due to the fire, and was held on June 1.

We were pleased to present the awards to:  
Po-Ching Chen and Peter Hahn.  
Congratulations, and best wishes in your studies and careers.

---

#### **IEEE MEMBERS RECEIVE MILLENNIUM MEDALS**

The Millennium medal presentation ceremony was cancelled due to the fire. The recipients will be recognized and given their award at the October 23<sup>rd</sup> Annual Free IEEE Lunch. Recipients not in attendance will be mailed their awards.

The recipients from the Los Alamos Section are:

Name: Mr. Don Machen  
Name: Ms. Jean Merson  
Name: Mr. Hal Weil  
Name: Mr. Joe Parker  
Name: Mr. Dave Wells  
Name: Dr. Albert Engelhardt  
Name: Dr. Christoph Borel

Please plan to attend and help us congratulate all the desiring members.

---

#### **PACE REPORT**

Paul Tallerico attended the 2000 Professional Development Conference in Phoenix, AZ, as the section's PACE representative. The conference was held at the Marriott Camelback Inn, a luxurious resort, near Scottsdale, and it began at 6 pm Sept 1, and continued until noon on Sept. 4. There were a few plenary sessions, where all the attendees were together, but most of the time, there were from six to eight parallel sessions, a Leadership Track, Women in Engineering, Engineering Management, Skills for More Effective Engineers, Career Development, GOLD Careers, GOLD Skills, and Professional Activities. In the past, the IEEE-USA would pay for half the expenses of a section representative and a PACE representative, as well as half the expenses of a GOLD representative. Let me remind you that GOLD stand for graduates of the last decade, and it is aimed at young IEEE members who are just out of school. We have interpreted this to mean those within a decade of any degree, so we have sent people who have recently received an advanced degree as GOLD representative. This year the IEEE-USA made it more complicated to receive their support, and starting next year, they will offer no support for the sections. The main reason is that the IEEE-USA had a large surplus, but lost most of it on an optional magazine called Today's Engineer. All USA IEEE members pay about \$23/year to IEEE-USA, and they use it to lobby the government to help us and for PACE activities. A few years ago a magazine devoted to professional development issues, essentially the eight sessions of the professional development conference. This magazine is optional, and costs about \$13.50 per year for IEEE members. The price was set lower than production costs in the

expectation that as more members saw how useful and good this magazine was, the subscriptions would rise, and the magazine would become revenue-neutral. This may yet happen, but the IEEE-USA surplus is being eliminated by the start-up cost of this magazine.

The content of the conference was good, but the only people who really get their money's worth are those who need Continuing Education Units (CEU's) to keep their Professional Engineering license current. You could get 12 CEU's for the \$1000 cost of the conference, hotel, airfare, and food. One of the main thrusts of PACE is that your employer only wants you to have a job, and if you want a career you must make one for yourself. This is true, especially in this time of continual right-sizing organizations, and outsourcing of more and more work. Most employers also give career advice, but there are so few employers in Northern New Mexico, that changing a job is usually difficult. I have a bound copy of summaries of all the lectures, which I will loan for three weeks to any member who wants to browse through it.

One professional development idea that I think may work in this area is to start a Future Cities competition in the middle schools in our area. The kids get to play computer games, optimize a small city, then write it up and build a scale model, with a \$100 cost upper limit. The Laboratory outreach group could be persuaded to pay for at least a few middle schools, and our section could pay for a few more. This would be a commitment of a few years for the Section, but the good news is that more kids would be exposed to the engineering processes. If we were to get enough schools involved, about 25, there could be regional competitions and national competitions.

---

#### **Minutes from Los Alamos IEEE Section Executive Committee Meeting**

---

Los Alamos IEEE Section Executive Committee Meeting Thursday, September 21, 2000 12:00 (noon) to 1:30 pm, Side Room C, Otowi Cafeteria

Attendees: Paul Tallerico, Lynda Towers, Teri Roberts, and Harold Weil.

The meeting was called to order at 12:05 pm

Agenda, IEEE Los Alamos Section Xcom Meeting 9/21/00

#### **Old Business:**

1. Minutes of last meeting

Minutes were approved as distributed via email in August.

2. Report on Professional Development Conference (Paul) The Professional Development Conference is in Arizona this year. Pre-conference workshops are available along with the regularly scheduled sessions. Companion activities are available and the accommodations are first rate. The IEEE USA has reduced its funding in support of conference participation. Requests for grants to attend this particular event were due in July. For the most part, if any of our members wishes to attend, they will be required to pay all of their expenses.

3. PACE report (Burton and Paul) Burton was unable to attend, but he did email info to Lynda, who will include the info in the next Enlightener.

4. Free lunch event

Late October is a desirable time. We decided to try for Wednesday, October 25th + or - a day. It will be held at Otowi and will be catered by Aramark.

Members and non-members will be required to reserve a place by submitting a check for \$15.00 per person. Member's fees will be refunded upon attending the event. This gives us some idea of required quantity of food for the Aramark catering. Veggie and meat enchiladas were suggested as the entree. Side dishes, bread, beverage and dessert will be included.

Date, cost, and menu need to be sent to Lynda for inclusion in the next Enlightener.

We will attempt to get Lawrence Tafoya (NMHU student chapter) to be our speaker. We need an abstract of his talk. Paul will make room reservations, line up catering, and contact Djuro Zrilic for the possibility of getting Lawrence.

We still have not distributed Millennium Awards and will attempt to do so at this event.

#### 5. Treasury summary

Total assets of the Section held in all accounts combined are \$18,966.10.

Acct. 01 Section Savings	\$3,157.00
Acct. 02 Section Checking	3,791.17
Acct. 04 Comp Sci Checking	674.31
Acct. 05 LEOS Checking	2,365.43
Acct. 06 NMHU Checking	12.20
Acct. 15 Section CD	3,701.55
Acct. 16 Section AAA Fund	5,264.44

(scholarships)

Teri presented the balance sheet, a summary of income and expenses, and Transaction Reports for each account for the period of Jan. 1, 2000 through Sep. 19, 2000.

Paul was reimbursed for travel earlier this spring and Harold was reimbursed for miscellaneous expenses incurred for Science Fair judging activities this spring.

Teri presented a description of the recently mandated IEEE Concentration Banking program. There was some discussion that accounts under \$25,000 could opt out. Teri will check with HQ and clarify if it is mandatory. The goal is to have all IEEE banking done via Mellon Bank in Pittsburgh, PA by the end of this calendar year. Teri has the information on enrollment from HQ. There was some discussion about the inactivity of the LEOS Chapter and the NPSS chapter. We will call for volunteers to re-activate these Chapters. Teri will check the bylaws for disposition of assets if we are not successful.

Show and tell of TAG material, and handouts from Region 6/PACE Meeting.  
This was deferred until a later time.

#### 6. Chapter Reports

Teri reports that the CS Chapter has a technical talk scheduled for October 5, 2000. She will send Lynda the info for the Enlightener.

Hal reports that he is not getting response from the NPSS Chapter members. Enlightenment, web presence, and email will be used to raise interest.

Teri reported that she used the official IEEE web site to report the Officers of the Section and the Chairs of each Chapter.

#### 7. Awards reports

The Millennium Awards have not yet been distributed. We hope to do so at the October free lunch event.

#### 8. Scholarships

We should limit our scholarships to the funding received from WESCON and the interest earned on Accts 15 & 16. We only got \$528 from WESCON this year. We were barely able to bestow two \$475 awards this year.

The idea of combining our resources with LANL's community outreach resources was discussed.

#### **New Business:**

##### 1. Next Enlightenment:

Deadline for submission of information is close of business Friday, September 22, 2000. October activities occur in early October.

##### 2. South West Area Fall meeting on October 28, at UNM in Albuquerque.

We decided that we should have a presence at this event because of its location. We can pay for 2 members of the Section and 2 members of the NMHU Student Chapter. Most likely, Paul and Burton will represent the section and Djuro and one student will represent the Student Chapter.

##### 3. Date of next Xcom Meeting

We will try to meet briefly prior to the Free Lunch Event.

##### 4. Other New Business

We need to nominate candidates for the upcoming election to serve next year.

Paul suggested we consider a PACE activity or sponsor a Junior Achievement group.

If we could get regional middle school students to prepare table models of future cities, we could have a regional competition. If enough interest is raised the regional winners could go on to a national competition. Participants could have

sponsors to help fund material costs for building the models.

Perhaps a limit of \$100 can be set.

5. Miscellaneous Items:

Teri checked into locations for Section and Chapter events. The LAHS never returned her calls. We assume this means that the high school is not interested in having us use their facilities. The Bradbury was accommodating and is willing to move the daily movie from the theater if we want to use it for an event. No charge for facility, we clean up after ourselves. The Mesa Public Library has several (partitioned) rooms available for no charge. If food is served there is a kitchen facility that can be used if a damage deposit is paid. We set up and clean up after ourselves.

The meeting adjourned at 12:54 pm.

**ACTION ITEMS:**

Paul - arrange room reservation, catering, and speaker for October Free Lunch event, get speaker abstract to Lynda ASAP

Lynda - get next Enlightener published

Teri - clarify banking situation, check by-laws, and send CS tech talk info to Lynda

Hal - try to stir up interest in NPSS

**Section Executive Committee:**

Chair

Paul J. Tallerico

Email: [tallerico@lanl.gov](mailto:tallerico@lanl.gov)

Voice: 505-667-1197 FAX: 505-665-2818

Vice-Chair

Lynda K. Towers

e-mail: [towers@lanl.gov](mailto:towers@lanl.gov)

Voice: 505-665-5172 FAX: 505-665-9490

Secretary/Treasurer

Teri Roberts

e-mail: [troberts@lanl.gov](mailto:troberts@lanl.gov)

Voice: 505-672-0270 FAX: 505-665-5723

Newsletter Editor

Lynda K. Towers

e-mail: [towers@lanl.gov](mailto:towers@lanl.gov)

Voice: 505-665-5172 FAX: 505-665-9490

Professional Activities

Paul J. Tallerico

e-mail: [tallerico@lanl.gov](mailto:tallerico@lanl.gov)

Voice: 505-667-1197 FAX: 505-665-2818

Membership Chairman (Also for NPSS)

Glen A. Wurden

e-mail: [wurden@lanl.gov](mailto:wurden@lanl.gov)

Voice: 505-667-5633

Awards

Jim Gattiker

e-mail: [gatt@lanl.gov](mailto:gatt@lanl.gov)

Voice: 505-665-0604 FAX:

Program Chairman

Burton Krohn

e-mail: [b.j.krohn@ieee.org](mailto:b.j.krohn@ieee.org)

Voice: 505-662-5190

Computer Society Chapter Chairman

David Izraelevitz

e-mail: [david.izraelevitz@alum.mit.edu](mailto:david.izraelevitz@alum.mit.edu)

Voice: 505-661-6880

LEOS Chapter Chairman

Albert Engelhardt

e-mail: [a.g.engelhardt@ieee.org](mailto:a.g.engelhardt@ieee.org)

Voice: 505-672-9246 FAX: 505-672-0374

NPSS Chapter Chairman

Harold Weil

e-mail: [hmwci@trail.com](mailto:hmwci@trail.com)

Voice: 505-983-1305 FAX: 505-983-1305

Past Chairperson

Albert Engelhardt

e-mail: [a.g.engelhardt@ieee.org](mailto:a.g.engelhardt@ieee.org)

Voice: 505-690-9758 FAX: 801-327-3150

IEEE Headquarters: [www.ieee.org](http://www.ieee.org):

L. K. Towers  
108 La Vista Dr.  
Los Alamos, NM 87544